

# Tectyl Heat Aqua No.3

*A Water Soluble Synthetic Quenchant for The Hardening of Ferrous Alloy, Oil-Free, Nonflammable*

### Description

Tectyl Heat Aqua No.3 is a concentrated aqueous solution of poly-oxyalkylene glycol. Tectyl Heat Aqua No.3 is inversely soluble in water and is inhibited against ferrous corrosion and meets the AMS(Aerospace Material Specification) 3025 Type I. Tectyl Heat Aqua No.3 has quenching characteristics, which provide a slower cooling rate in the convection phase or third stage of the time-temperature cooling curve.

### Typical Physical Properties

Appearance		Hazy Liquid
Specific Gravity	(15/4℃)	1.08±0.05
Kinetic Viscosity	(40℃, mm <sup>2</sup> /sec)	300 ± 30
Flash Point	(℃)	N/A
pH		9.5 ± 0.5
Factor		2.5
Corrosion Protection(5% sol'n)		Excellent

Solubility in Water Inverse, at temperature 74℃ or higher the production will be insoluble in water

(note) The above mentioned properties are average values from analysis on the standard sample. Little differences in manufacturing process may be observed but it doesn't mean problematic performance.

### Application

Tectyl Heat Aqua No.3 solutions cover a wide range of quenching effects depending on solution concentrations and temperatures. The quenching characteristics of Tectyl Heat Aqua No.3, as demonstrated by time-temperature cooling curves, have a slower rate of cooling during the convection phase. This slower cooling rate in the third stage of the quenching mechanism will eliminate the tendency for

for quench cracking or distortion problems in some alloys and work pieces.

Tectyl Heat Aqua No.3 is formulated to quench ferrous alloys and is recommended as a quenchant in the following processes:

#### ◆ SURFACE HARDENING

Gears, spindles, camshafts, bearing journals, drill pipe and etc. that are induction or flame heated are traditionally quenched in oil. Tectyl Heat Aqua No.3 can replace the quenching oil and eliminate the fire hazard and reduce smoking.

#### ◆ FORGINGS

Steel forgings of high and low hardenable material can be hardened in solutions of Tectyl Heat Aqua No.3 at 8 – 25% concentration.

#### ◆ CASTINGS

Tectyl Heat Aqua No.3 is recommended for quenching of steel castings at concentration depending on alloy from 9 – 25%.

Nodular and ductile iron castings can be quenched in solutions of Tectyl Heat Aqua No.3 at 10 – 30% concentration.

The above applications are examples. The actual solution concentration of Tectyl Heat Aqua No.3 may vary depending on the work piece, chemistries, dimensions, equipment being used, and so on.

### Concentration Control

The concentration control of Tectyl Heat Aqua No.3 solutions is based on their kinematic Viscosity.

A sugar refractometer can be used for in-shop concentration control in Tectyl Heat Aqua No.3 solution. The factor to be used with the sugar refractometer is 2.5 for new solution.

The concentration of new Tectyl Heat Aqua No.3 solutions is determined by multiplying the refractometer reading by the factor 2.5. As polymer quenchant solutions are used, they become contaminated.

This contamination in time will affect the solution's refractometer reading, making the solution concentration obtained by the sugar refractometer erroneous. Therefore, we recommend a periodic solution concentration check by Kinematic Viscosity. The periodic concentration check by Kinematic Viscosity is routinely performed in our Laboratory Center free of charge to our customers.

### Cleaning

Due to the inverse solubility of Tectyl Heat Aqua No.3, parts quenched in Tectyl Heat Aqua No.3 solutions will have a polymer film covering them. This polymer film is easily removed by rinsing the quenched part in plain cold water.

Parts that have been tempered before cleaning may require longer cleaning cycles to remove the dried-on polymer film.

### Storage

Heat Aqua No.3 is unaffected by freezing and thawing. If stored outside at cold (below freezing) temperatures, bring to room temperature and roll the drum to insure that all materials are properly mixed before using. Avoid contact with strong oxidizers.

### Shelf Life

Under normal conditions the recommended shelf life for Tectyl Heat Aqua No.3 is six (6) months.

### Package

Tectyl Heat Aqua No.3 is packed in 200 liter drum.